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Claims

1. A process of extracting oil from a substance, the method comprising the steps of:

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- a) contacting the substance with a solvent comprising HFC 134a, and optionally one or more co-solvents, in a sealed first vessel;
- 10 b) elevating the temperature of the sealed first vessel, and optionally causing agitation of the heated mixture;
- 15 c) separating the resulting solution from the substance by transferring the solution to a second vessel;
- 20 d) cooling at least the second vessel to release oil from solution; and
- e) separating the oil from the solution.

2. A process as claimed in claim 1, wherein the co-solvent is liquid at room temperature.

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3. A process as claimed in claim 1, wherein the co-solvent is selected from the group comprising: hydrocarbons; low boiling aliphatic esters; ketones; chlorinated, fluorinated and chlorofluorinated
- 30 hydrocarbons; ethers; dimethyl formamide; tetrahydrofuran; dimethyl sulphoxide; alcohols; carboxylic acids; acetic anhydride; and nitriles.

4. A process as claimed in claim 3, wherein the
- 35 co-solvent is selected from the group comprising:

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alkanes; benzene and its esters; acetates and butyrates; acetone; methyl isobutyl ketone; methyl ethyl ketone; dichloromethane; dichloro difluoromethane; dimethyl ether; diethyl ether; methyl alcohol; ethyl alcohol; n-propanol; iso-propanol; acetic acid; formic acid; and acetonitrile (methyl cyanide) anhydrous liquified ammonia; liquified sulphur dioxide; nitric oxide; nitrogen dioxide; nitrous oxide, and hydrogen sulphide, carbon disulphide, nitromethane, and nitrobenzene.

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5. A process as claimed in claim 3 or 4, wherein the co-solvent is selected from the group comprising: lower alkanes, lower alcohols (ie C₃ or lower), acetone, dimethyl ether and diethyl ether.

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6. A process as claimed in any preceding claim, wherein the sealed first vessel is heated to a temperature of from 40 to 60°C, inclusive in step (b).

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7. A process as claimed in any preceding claim, wherein the second vessel is cooled to a temperature in the range -10° to 25°C, inclusive, in step (d).

8. A process as claimed in any preceding claim, wherein the substance is selected from the group comprising: seeds, nuts, ground nuts, and oil shale or mud.

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9. A sealable apparatus comprising first and second vessels, each vessel having at least one closable valve through which solvent may pass, wherein the first and second vessel are in fluid communication with one another by means of the closable valves, wherein the first vessel is adapted to receive a substance from which oil is to be extracted and incorporates a filtering

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device to prevent passage of the substance out of the first vessel through the or each valve and the second vessel is provided with cooling means and/or is associated on its inlet side with means for cooling incoming solution, and wherein a solvent comprising HFC 134a together with one or more optional co-solvents is provided in the first vessel and may be transferred between the first and second vessels via the or each valve.

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10. Apparatus as claimed in claim 9, wherein the or each valve is a one way valve and the first and second vessels each have an inlet valve and an outlet valve, the apparatus being arranged in the form of a circuit so that the outlet valve of the first vessel is connected to the inlet valve of the second vessel, and the outlet valve of the second vessel is connected to the inlet valve of the first vessel, so that the flow of solvent around the circuit occurs in one direction only.

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11. Apparatus as claimed in claim 9 or 10, wherein the first vessel is provided with a heating means and/or is associated on its inlet side with means for heating incoming solvent.

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12. Apparatus as claimed in any of claims 9 to 11 wherein the apparatus includes a reservoir of additional solvent and means for introducing or removing solvent from the circuit, the point of addition or removal of solvent from the circuit preferably being between the outlet side of the second vessel and the inlet side of the first vessel.

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13. Apparatus as claimed in any of claims 9 to 12, wherein the apparatus includes means for withdrawing from

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the second vessel directly and/or from the inlet side of the second vessel oil which has separated from the solvent.

- 5 14. Apparatus as claimed in any of claims 9 to 13, wherein the apparatus includes means for determining the pressure in the circuit and/or the temperature of the first and second vessels.
- 10 15. Apparatus as claimed in any of claims 9 to 15 wherein the first and second vessels are transparent pressure vessels capable of withstanding pressures of not more than 25 bar.

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